Plan Title:	**2000 Decennial Census**
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PART I - INFORMATION TECHNOLOGY ARCHITECTURE PLAN

1. Information Requirements

A. Introduction

Within nine months of Census Month, April 2000, the Census Bureau will collect, review, process, and tabulate data for over 118 million households and will deliver to the President state level counts needed to determine the number of seats in the House of Representatives entitled to each state. By March 31, 2001, the Census Bureau will deliver tabulations for small geographic areas to each state for use in their individual redistricting plans.

Subsequent to these legally mandated tabulations, the Census Bureau will use both complete count and sample information to generate a myriad of data products for a wide variety of users. These products affect the distribution of billions of dollars each year and influence research and decision making in the public, private, and academic sectors. In essence, census data will serve as a national benchmark and a frame of reference for most statistical, socioeconomic, and political analyses in the following decade.

It is difficult to appreciate the scale of a decennial census. It is incomparable in scale to any other program of the Bureau of the Census. In fact, it is the largest peacetime undertaking of our Federal Government.

Constant change in our environment including increasing mobility, expanding language barriers, changes in the traditional structure of the family unit, increasing fear of government, changes in the labor pool available for census enumeration, as well as changes in technology, dictate that each decennial census is necessarily entirely different than the one before it.

As such, systems and methods used during the 1990 decennial census are totally obsolete as of this writing. There are no legacy systems to convert to new platforms, although this would be a likely strategy for continuous programs of much smaller scale. The only constants from one decennial census to the next are the immense scale of the decennial census, the continually escalating costs, the predictable controversies concerning census results, the massive program buildup once every ten years, and the very specialized knowledge held by career Census employees who consistently make each decennial census more successful than the one before.

B. Information Flow

The following includes a high-level description of Census 2000 processing requirements by major census work centers (i.e., Data Capture Centers, Headquarters, Field Offices). Telephone Questionnaire Assistance and Integrated Coverage Measurement Operations requirements are addressed separately.

Data Capture Center (DCC) Processing Requirements

1. Check-In

Data collection is the first step in the process flow and involves the methodologies and processes of gathering census data from the public. The Census Bureau sends short-form, long-form, and alternative questionnaires to households in the United States for completion. Respondent forms will be returned to the data capture centers for check-in and data capture processing. The DCC's workload begins with the receipt of incoming mail.

Respondent census forms will be delivered to the data capture centers by the U.S. Postal Service (USPS). The USPS will provide a preliminary sorting of forms by form type and, upon receipt at the data capture centers, the forms (in their original envelopes) will be checked in and further sorted by personnel, if required.

The Census Bureau anticipates that approximately 70 million census forms will be received and processed within 14 days of Census Day. The Census Bureau must know which addresses have and have not returned their forms within this period in order to initiate the nonresponse follow-up process (if no form is received, that address will either receive another form in the mail or receive a personal visit from a census enumerator). Therefore, approximately 70 million forms must be checked in within the first 14-day period . All remaining forms delivered to the data capture centers (approximately 50 million) shall be checked-in as received. Any contractor-provided solution that can handle checking in 70 million forms in 14 days should be able to handle the remaining check-in workload. In the past, the Census Bureau has sorted and checked-in the returns by using high-speed sorters reading the Census Bureau bar code information on the envelope.

2. Data Capture

Once forms are checked in and sorted, personnel remove the envelopes and ready the questionnaires for data capture. Prior to data capture, personnel must unfold the questionnaires, separate the sheets (if necessary), attempt to fix any tears, perform any other necessary clerical operation, and edge-align the forms into stacks. Since forms will be handled by several persons (including both the respondent and the DCC personnel) prior to data capture, the condition of the forms may be degraded from original.

Data capture is the manual and/or automatic reading and interpretation of respondent data from completed census forms. Specifically, it involves the conversion of respondent answers and other identification and control information on the form to electronic format for computer processing. DCS2000 accomplishes this by scanning the forms and then passing the scanned image through optical mark recognition (OMR) and optical character recognition (OCR) engines to convert the image data into ASCII, a computer-readable data format. Where forms cannot be scanned, or where OMR/OCR engines cannot successfully interpret the data contained in the form's fields, a data entry/data edit process must be introduced to capture the data by key entry.

3. Data Capture Control Operations

While the census data capture operations are taking place, a series of processes take place concurrently to control the flow of supplemental mailings and Field operations. These steps include:

- Update the DMAF with adds, deletes and corrections from LUCA operations.
- Update the DMAF with adds and deletes from Post Master Return operations.
- Update the DMAF with check-in status.
- Assign geographic and housing identifiers to unaddressed questionnaires (includes Be Counted Forms and reverse CATI). Send new addresses for Field verification and accept confirmations.
- Prepare a file of addresses for the second mailing based on the check-in status.
- Identify the nonresponse Follow-up universe based on the check-in status and the availability of administrative records data. This is a two-phase operation. The first phase is to insure full coverage of housing units up to the 90 percent mark. The second phase is to apply a statistical sample for the last 10 percent.

4. Other Processing Operations in the DCC

- **Content Edit Failures** - As data are captured and edited in the DCC there will be entries that are inconsistent with other entries. The current plan is to blank the inconsistent entries and allocate in post-capture file processing.

- **Automated Coding** - This system will include Industry and Occupation (I&O), Place of Birth (POB), Migration (MIG) and Place of work (both places are blocks). The system will use the ASCII data derived from the questionnaire images. These systems will use dictionaries to code the write-in data. Initial coding using the ASCII data will be done at the Charlotte Computer Center (CCC), or at the Bowie site. The clerical production will be done in the DCCs starting by August 1, 1995. The dictionaries and reference file will require substantial work. The project will consist of three phases:

  Phase I - dictionary/reference file development (January 1997 to May 2000) DOT will participate in the development.

Phase II - Machine coding (CCC) from ASCII data fully captured from the census forms.

Phase III - clerical resolution (this will include a dictionary/reference file update function).

Field (RO, RCC, LCO) Processing Requirements

The Decennial Field Interface (DFI) provides the framework for field collection control activities at the Regional Census Centers (RCCs) and Local Collection Offices (LCOs). Its goal is to provide timely data necessary for the effective management of these offices. The DFI also contains interfaces to other subsystems developed for operations residing at the ROs, RCCs and LCOs:

The DFI consist of seven principal components: (1) Operations Control, (2) Office Support Systems, (3) PAMS/ADAMS, (4) Geography Systems, (5) Integrated Coverage Measurement Control, (6) Administrative Control Systems, and (7) MIS.

1. Operations Control

The Operations Control module identifies the collection control activities managed at the RCCs and LCOs. It consists of the following functions:

- Reporting/Graphics - Produces management reports (e.g., maps, charts, tables), ad hoc query capability, print/view capability.

- DO/RCC Authorization - Defines workload, production rate, duration, and staffing level for each field operation.

- Structuring Assignment/Assignment Tracking - Creates basic work units, loading assignment universe, printing assignment listings, maps, labels, etc., check-out assignments, check-in completed work.

- Production Printing - Produces maps, listings, labels, directories.

- GQ Control - Extracts Special Place/Group Quarter (SP/GQ) assignments; prints appropriate directories, listings, enumeration records; updates SP/GQ file, check-in, check-out to ICC.

- HU Control and Enumeration Operations - Tracks nonresponse universe and cases completed, Enumerator QA, PMR Follow-up, Nonresponse Follow-up, Update/Enumerate, List/Enumerate.

- Be Counted - Identifies targeted areas, distribution sites, maintains inventory of forms, questionnaires and promotional materials.

- ICM Non-CAPI Operations Control - DSE Follow-up, HU Follow-up, Mover/tracing.

2. Office Support Systems

Provides general office automation capability such as:

- Automated Help Desk
- Word Processing
- E-Mail
- Spreadsheet
- Image/Document Management

3. PAMS/ADAMS

The Pre-Appointment Management System/Automated Decennial Administrative Management System (PAMS/ADAMS) consists of the following modules:

- Applicant File
- Applicant Name Check
- Payroll Processing
- Personnel Actions
- Management Reporting

PAMS/ADAMS will satisfy all the information needs required by the components for both management and operational personnel at all offices including the District Offices (DOs), Regional Census Centers (RCCs), the Image Capture Centers (ICCs), and Headquarters.

4. Geography Systems

Provides for the following operations:

- LORCON/LEAF - tracking by geographic entity
- MAF Updates/Maintenance
- Map Creation/Production
- TIGER Updating/Maintenance
- STAT/Political Areas Programs
- MAF Browse
- Management Reports

5. Integrated Coverage Measurement (ICM) Control

A Computer Assisted Personal Interview (CAPI) Control operation consisting of:

- Sample Control
- Assignment Preparation/Tracking
- Work unit Check-in
- Supervisory Review
- Management Reports
- Close-out

6. Administrative Control Systems

Provides for:

- Space Leasing
- Logistics (furniture, equipment, supplies, etc)

7. MIS 2000

A comprehensive reporting system covering all aspects of the decennial census. Components of the Decennial Field Interface will "feed" information to the MIS2000 for global reporting purposes.

Headquarters Processing Requirements

Printing and Mailout of Questionnaires

The printing, assembly, and mailout of the 2000 census mailing packages as well as all other Public Use Forms are always contracted out by law. The Government Printing Office (GPO) has the legal authority for the preparation of the contract based on Census Bureau specifications and requirements, as well as the announcement and selection of the contractors. The capability of the contractors are assessed as part of the initial selection process. Secondly, the contractors' ability to meet all Bureau requirements is assessed during the prior-to-production run. Thirdly, Census Bureau and GPO staff are on site during the actual production process to assure each aspect of the production process meets Census Bureau quality assurance standards.

Post Data Capture Operations

After the census data are collected and in an ASCII format, a series of processes take place prior to the creation of the final census files. These steps include:

- DCF - Create the Data Capture File (DCF) by merging the OMR, OCR, KFP and KFI data for each return along with the CATI/CAPI data.

- PSA - Apply the Primary Selection Algorithm (PSA) to unduplicate persons between multiple returns for a housing unit and to determine the return of record for the housing unit and the persons to include at the housing unit.

- CUF - Create the Census Unedited File (CUF) by merging the DMAF control file with the PSA results and the administrative records data keeping only housing units that are confirmed to exist on Census Day.

- CEF - Create the Census Edited File (CEF) by applying a series of line item edits to the CUF file and impute for missing data (edit and imputation).

- Estimation - Based on information collected during PMR, NRFU and ICM operations, perform a statistical estimation procedure to get the final census counts for housing units and persons.

- Weighting - define and produce the weights for the sample data.

- Count Review - create edit level and summary level matrixes for subject matter experts to review the data.

- Release the data - provide the final housing unit and person counts, input to the DADS system and produce PUMS files and other related release files.

Administrative Records

Administrative Record files will be acquired from various public sources and will be used to create an Administrative Records data base. To create this data base the Administrative Record files must be processed as follows:

- Convert, standardize, and reformat the contents as required; assemble processing work units.
- Geocode each record.
- Unduplicate and consolidate items to create the Administrative Records data base.
- Tabulate and report results and status of all operations.

Automated Matching

Because of the extensive availability of "Be Counted!" forms, administrative records and other files, it is critical that data from these sources be matched to the census data using a number of match keys. Also, the ICM will require extensive matching. The main match keys are address, name, date of birth, demographics, etc.

This is not a system in the normal sense but a set of routines that are used in many census operations. There is extensive research currently being done on matching. Currently, research is being done to develop generalized matching routines that can be used by many different systems.

Archiving Requirements

A system for archiving census data. The system shall adhere to all NARA requirements, including those delineated in the Code of Federal Regulations for electronic (36 CFR Part 1228.188(b)) and micrographic (36 CFR Part 1230) media.

The Census Bureau will designate the files that the system shall archive. The system shall be able to archive any files from any stage of the data capture process and post data capture process.

In past censuses, two types of files were archived:

- The image of each page of every questionnaire was stored on microfilm.
- A file of ASCII data representing every response was stored on tape cartridges after content and coverage edits and any necessary coding operations had been completed.

The Census Bureau expects that these two types of files will be archived for the 2000 census.

Beta Site

An IT contractor will develop a software control and release system for use in the Census Bureau. The Beta Site will:

- Test all software for security compliance.
- Insure new releases of software do not effect other software.
- Maintain complete version control of all deployed software (systems and application).
- Provide a real time system wide monitoring and control capability.

A site will have a set of hardware and software that is an accurate and current representation of the hardware/software environment at the DCC, RCC, and DO. This function will be contracted out.

Data Access and Dissemination System (DADS)

DADS is a Bureau-wide system that is to support all Census Bureau programs, but the volume of requests for census tabulations will be substantially larger than the nondecennial volumes.

Therefore, the decennial must support the expansion of the system to the size needed to meet the decennial level of work.

DADS is an "external" system in that it is open to public use. The decennial volume of use will require an upgrade of the telecommunication capacity prior to the census data release on 1/1/2001. Also the other decennial products such as Topologically Integrated Geographic Encoding (TIGER) system, test files, etc., will be released earlier and will also create more volume of data requests. Also, the Dress Rehearsal data will be made available in early 1999 for testing by users. This will result in a early increase in DADS use in early 1999.

Mapping

For the 1990 decennial census the Geography Division produced map products by using the Census Bureau's centralized computer resources (Unisys and VAX) to produce plot files, copying those files on to round reel tapes, physically shipping the tapes to DPD and selected ROs, and plotting, cutting, and folding the final products at those remote sites. The processing power needed to accomplish these tasks was enormous as was the overhead of controlling and distributing from a central site. For the 2000 decennial mapping needs we intend to make three major innovations: decentralized production of many plot files on desktop Unix workstations or servers instead of large centralized machines, use of CD-ROM as the primary medium of distributing plot files, and the use of 11x17" laser printers instead of large format electrostatic plotters where possible. It is our intent to move a large portion of this work from Geography Division headquarters to DPD and the regions (ROs for now, RCCs when they are opened). For more information, see the Information Technology Plan for the Geographic Support Systems (GSS).

Management Information System

The 2000 census MIS will be using a three tier client/server architecture. The data will be housed in a data warehouse on a central server and the application files will be distributed on the client and server systems. The warehouse will contain data from the various transactional/processing systems such as PAMS/ADAMS, CCS, CATS, CAMS, LORCON, AIS, and others, which will be extracted on a regular basis to refresh the SAS datasets in the warehouse. The warehouse will reside on a server at headquarters (HQ). The clients will reside on user desks at HQ and in the Regional Census Centers, Data Capture Centers and District Offices.

Integrated Coverage Measurement (ICM) Operations Requirements

Integrated Coverage Measurement is a coverage measurement methodology used to estimate the number of people and housing units missed or counted more than once in the census, and combine the estimates with the enumeration results before producing a single set of official census results.

The following is a list of the fundamental steps to conducting an ICM:

- **Sample Selection**

  Sample selection will be conducted from HQ. The sample size to be used for planning purposes is 25,000 block clusters. The average number of housing units per cluster is expected to be 40. This gives an estimated sample size of 800,000 housing units. (The 1990 PES sample size was 175,000 housing units.)

- **Listing**

  High Tech Option(s): Listing and map spotting using a pen based computer and GPS (Global Positioning System). The system must be prepared to either print the maps for further processing or have the mapping software extended through the processing. Extending the high tech option through the processing would include giving the matchers computer monitors and software to display and/or update the maps and then sending the updated maps out during the follow-up.

  Low Tech Option: Listing by paper.

- **Address Matching**

  Address matching includes computer matching, clerical matching, field follow-up to resolve discrepancies and final clerical matching. The computer matching can be done on a VAX or a UNIX platform either at HQ or off-site. For 2000, we would like to centralize the matching into one site - Jeffersonville.

  Clerical matching will be automated to the greatest extent possible. Provide a "windows" environment where the matchers can open up the appropriate window to get the information. This will require larger monitors (possibly X terminals) and a computer system that can handle multiple processing.

- **Interviewing**

  The complex ICM interview (if 1995 is the prototype) cannot be conducted in a paper format. A CAPI instrument using a pen based instrument is necessary.

- **Resident Status Coding**

  The Resident Status Coding operation is a clerical review of the ICM interviews to determine residency.

- **Dual System Estimation (DSE) Matching**

DSE (or person) matching includes computer matching, clerical matching, field follow-up to resolve discrepancies and a final clerical matching.

- **Imputation & Estimation**

  Will be done as part of Headquarter's total processing requirements.

Telephone Questionnaire Assistance (TQA) Requirements

Use a fully integrated TQA-Computer Assisted Interview (CAI) instrument which includes reverse Computer Assisted Telephone Interview (CATI). This alternative eliminates paper records and is similar to the approach used in the 1995 test. It is anticipated that the Year 2000 system will require a substantial development effort. The Year 2000 instrument will include easy accessibility to all key concepts, as well as automated call scheduling for call backs, automated assignment of "reason for call," audit trail for each call by operator.

The TQA Center will receive questions from the public via telephone. These calls will be:

- request for questionnaire preparation assistance
- request for a replacement questionnaire
- request for a telephone interview
- comments on the census

2. Planned Processing and Telecommunications Architecture

A. Current Architecture

Ongoing Census Bureau programs like current surveys follow a traditional evolutionary process of system design and system life-cycle. The decennial census program, on the other hand, follows a less traditional path in the areas of systems development and life-cycle. Essentially, the systems and methods used for the 1990 decennial census are obsolete, mandating that the Census Bureau design and implement all Census 2000 systems from "the ground up."

Furthermore, a program of the scale of a decennial census is not supported by one major system which is easily described in terms of program objectives, information flows, and alternative configurations to support them.

During the past year, DMD has led an effort to define all major computer systems for Census 2000. This effort is known as the Major Initiative for Decennial Acquisition of Systems (MIDAS). MIDAS includes twenty-seven major systems to support the decennial census information requirements spelled out earlier in Part 1, Section 1. DMD is currently working with a contractor to further analyze and define feasible architecture alternatives for these major decennial computer systems.

These alternatives will be used to develop requirements analyses which will be the basis for requirements initiatives in support of procuring IT hardware to support the decennial census. See PART II, Section 1, CONTRACT STRATEGY for more information regarding planned procurements. All new systems developed for Census 2000 will comply with applicable open systems standards.

Projected workloads are now known for all major systems. The architectural detail of some components of an integrated IT solution for Census 2000 is also now known. These systems and workloads are described below.

Data Capture Center Alternative Configurations

Complex systems needed to fulfill data capture requirements and workloads unique to a decennial census, described in Part 1, Section 1, are defined in significant detail in a February 1996, procurement sensitive document titled BENEFIT/COST ANALYSIS OF THE 2000 CENSUS DATA CAPTURE SCENARIO. For a copy of this document, contact the Census Bureau, Information Systems Support and Review Office of the Information Technology Directorate.

Field Office System Configuration/Sizing

Regional Census Centers (RCCs)

There will be twelve RCCs, scheduled to open early to mid-1998, and close early 2001. Early operations (before RCCs are open) will be conducted from the Regional Offices. Once the RCCs are open, operations will be moved from the RO to the RCC.

The RCCs will house high-end Unix servers, responsible for storing and processing data for most of the sub-systems described earlier in this document. Within each RCC, users will access these servers over a local area network (Novell)), using PC-based (Windows95) desktop computers (40-50). Interconnected with these user workstations will be digitizing workstations (4-13), imaging workstations (5-10), electrostatic plotters (2-10) and printers. RCCs will be interconnected (including HQ, ICCs, and Ros) over a Wide Area Network (projected to be at least 128Kbps Frame Relay).

Local Census Offices (LCOs)

There will be approximately 556 Local Collection Offices. These offices are scheduled to open late 1999, and close late 2000. LCOs will be opened exclusively to perform Census Operations.

Each LCO will consist of a PC server-based LAN (Novell), PC-based (Windows95) desktop computers (10-15), and imaging workstations (3-5). Applications developed for the LCOs will be either batch oriented (e.g., data/image capture) or client/server, accessing an Oracle DBMS

located at an RCC. Connectivity to the RCCs will be via a WAN (projected to be at least 64Kbps Frame Relay).

Field Operation Supervisor (FOS) Offices

There will also be approximately 376 FOS offices. These very small, very temporary offices are designed to support the major precensus field operations. The FOS offices will open early 1998, and close by the end of 1998.

Each FOS office will consist of PC-based (Windows95) desktop computers (1-3), printer and modem. Connectivity to an RCC will be via 28.8Kbps dial-up service. Many of the automated functions required for the FOS office (e.g., recruiting, payroll), will be provided by the RCC.

Field Workload and Schedule

Operations within the scope of the Decennial Field Interface, fall into two basic categories: (1) Field Operations and (2) Office Operations. For the 2000 census, these operations will chronologically occur as follows:

Field Operations

Late 1998 - Late 1999 (Early Operations)

Recruiting/Testing (All Offices)	
MAF Reconciliation (RO)	12.5 million HUs
QA Listing (FOS)	1.5 million HUs
Advance Listing (FOS)	17-25 million HUs
Targeted MAF Validation/QA (RO)	1.2 million HUs
Field Verification/QA (RO)	12.5 million (10 percent of total addresses)
LUCA/PALS Tracking (RO)	39k (25 percent of all GUs)

Early 2000 (Precensus Operations)

Recruiting/Testing (All Offices)	
Update/Leave/QA (LCO)	17-25 million HUs
Field Verification (LCO)	6.25 million (5 percent of total addresses)
Residual CATI Follow-up (LCO)	
Special Place List (LCO)	

Early to mid-2000 (Census Operations)

Recruiting/Testing (All Offices)	
Update/Enumerate (LCO)	
List/Enumerate (LCO) 750k (includes PR&Outlying Areas)	
Service-Based Enumeration (LCO)	
GQ Enumeration (LCO)	
T-Night Enumeration (LCO)	
PMR Follow-up (LCO)	8 percent of total mailout
Nonresponse Follow-up/QA (LCO)	90 percent of Nonresponse
Walk-in Questionnaire Assistance	12,000 sites (1000 per RCC)
Block Splits (LCO)	360k Blocks (TAR only)
Be Counted (LCO)	75k sites (6300 per RCC)

Office Operations

Late 1998 - mid-2000 (Administrative Operations)

Recruiting/Testing (All Offices)
Clearance (RCC)
Staffing Summary Reporting (RCC)
EEO/Handicap Profiling (RCC)
Payroll/Personnel (RCC,LCO)
Administrative Control Operations (LCO,FOS)

Late 1998 - Late 1999 (Early Operations)

Assignment Preparation (RO,FOS)
Register Control (RO,FOS)
Map Control (RO,FOS)
MAF/TIGER Updates (RO)

Early 2000 (Precensus Operations)

Assignment Preparation (LCO)
Register control (LCO)
Map Control RCC,LCO)
Field Verification Updates (RCC)

Early - mid-2000 (Census Operations)

Assignment Preparation (LCO)
Assignment control (LCO)
Register Control (LCO)
Map Control (RCC,LCO)

Check-in/Check-out (LCO)
Merge/Sample Tolerance Check (LCO)

For Dress Rehearsal the above operations will be conducted approximately two years **prior** to the 2000 census.

Required Network Infrastructure for the 2000 census

With the recent passage of the Telecommunications Act of 1996, the future of telecommunications has become uncertain. The service offerings and rates available, the vendors in the business, and the access methods that will be employed to bring these services to our homes and offices in the year 2000 will not resemble the current market. The discussions herein pertain to the current marketplace and are germane to whoever implements the network, be it Government or contractor. The watchword for the next few years is: be flexible. As long as we can be certain that there is at least one vendor that can provide our required network services, there is no advantage in hurrying to firm up the network topology. Technology will be advancing at an accelerated pace; therefore, to take advantage of everything that the marketplace will have to offer, it behooves us to delay final design of the network beyond the dress rehearsal.

Interoffice data transfer requirements for the 2000 census are expected to remain at the same magnitude as the 1990 census, with the possible exception of the data flow between the Local Census Offices (LCOs) and their controlling Regional Census Centers (RCCs). In 1990, except for the Beta Site and the collocated processing office, each of which was served by a T-1 trunk, each of the processing offices (PO) was served by channels that aggregated to 56kbps and each of the RCCs had 38kbps bandwidth service. We used a star topology, connecting these offices directly to headquarters. We linked the LCOs and their respective RCCs by a dial-up network with 2400bps modems. The LCOs initiated all calls. We had one other 2400bps modem at each LCO, which was used for computer diagnostic purposes. Digital Equipment Corporation maintenance personnel called into these modems when bid to do so under very tightly controlled circumstances.

With the exception of the diagnostic links, which are currently unknowable, the ideal network consists entirely of 64kbps Frame Relay connections at every office. This permits us the maximum flexibility for establishing and using the network. Every office could communicate with every other office in this private network just by addressing the messages to their recipients, which would be taken care of automatically in the computer. In terms of getting the network installed, frame relay networks are easier for the phone companies to engineer than dedicated circuits; the only line segments that need to be furnished by the serving phone company are a T-1 trunk between the central office and the census office plus a channel of appropriate bandwidth, which happens to be double the committed information rate, between the central office and the frame relay provider's terminating office. In all major cities it is highly likely that a T-1 or greater link already exists between each central office and the frame relay provider's office. T-1 trunks to the census offices are easy to engineer, because they can be carried over conventional twisted

pair copper wires. In the more remote LCO cities we anticipate that the major engineering problem will be linking the central offices with the frame relay provider's terminating offices. The Telecommunications Office is investigating the nature and magnitude of that problem now.

The current pricing structure of frame relay networks is similar to that of dedicated circuits; there is a one-time installation charge with fixed monthly charges, which are based on the level of service, not on usage. The cost of such a network would be nearly the same as or possibly less than the cost of a network comprised of dedicated lines of the same bit rate. An added appeal of a frame relay network is its flexibility; if a node requires a higher rate of service, it can be accommodated quickly. With current service offerings, frame relay service to all LCOs would be the most advantageous. A full-time service such as this permits the LCO operation to be designed around Client/Server applications, which are the most efficient for us to develop and operate. If frame relay services will not be widely available, an alternative would be to use dial-up lines with the fastest modems available, keeping them up throughout the business day while running Client/Server applications. The disadvantage is not so much the cost to operate as it is the reduced bandwidth. Client/Server operations tend to require much more bandwidth than conventional interactive applications. We may have to redesign the LCO computer operations if frame relay cannot be had universally.

B. Alternatives

The Bureau of the Census continuously undertakes efforts to improve each decennial census, including the 2000 census. As improvements are proposed in systems or methods, each proposal undergoes extensive internal scrutiny to ensure near optimal solutions are selected for the many challenges inherent in a decennial census. This is reflected in the history of the decennial census which reveals that the Bureau has made progress in improving efficiency of operation and the evaluation of census coverage over several decades.

Standardization

The pros and cons of standardizing operating systems and programming languages among the agency components involved in the decennial process are being evaluated. The potential benefits from opportunities to share well trained and highly specialized computer programmer resources among agency components in systems development and maintenance was seen to outweigh the cost of retraining or any systems conversions needed to achieve standardization.

Systems Centralization

In processing the 1990 census, the volume of Master Address File updates centralized at one location caused a significant bottleneck. Decentralization spreads the workload to reduce bottlenecks and distributes system risk. On the other hand, total decentralization of MAF maintenance function to the local census center level would be very costly in terms of hardware

as well as personnel. Similar rationale was used to arrive at the appropriate level of centralization for each significant process.

Data Capture

The most significant element of new IT investment will be in the area of data capture. The Census Bureau continues to evaluate the benefits and costs of alternative data capture solutions.

Owing to a belief that optical character recognition (OCR) technology has now reached an acceptable level of maturity, the Census Bureau is assessing the use of OCR as a likely solution for the 2000 census. Write-in responses not successfully captured through OCR technology would be keyed from digitized screen images of the source document, not from paper.

The feasibility of OCR for write-in responses will be compared to that of keying from paper exclusively, and a hybrid solution which includes scanning, optical mark recognition (OMR), and keying from image.

These alternatives to previous methods involving the keying of write-in fields from paper and a custom engineered solution involving optical mark recognition from photographic negative images of questionnaires, presents an opportunity to reduce costs and management risks.

Potential cost savings from these technologies are expected to result primarily from reduced labor costs including keyer salaries, benefits, and related overhead.

Tabulation and publication

Selected printed or electronic copies of data files and special tabulations will be made available. Professional users of statistical data will likely use generalized commercial software to analyze data in formats produced by the Census Bureau. Although such software might alternatively be provided for the user by the Census Bureau, the Census Bureau chooses not to develop custom solutions when "off the shelf" solutions are available.

See Part 1., Section 1., B. Information Flow, Headquarters Processing Requirements, Data Access and Dissemination System, (DADS).

Telecommunications and network systems management

The cost of data communications from a very distributed system of at least 560 local census centers will be significant. Every reasonable telecommunications service alternative will be considered. Selection factors for such alternatives include security, cost, transmission speeds, availability in rural areas, maturity of technology, lead time to delivery, ease of use, performance (failure rate), and standards.

The overriding consideration with respect to any telecommunications alternatives considered is to secure the confidentiality of information from census respondents. There are other important factors to consider including: lead time between when office space becomes available, when service can be made available by local telephone companies, and when data collection operations begin.

See **Part I Section 2.A. Current Architecture**, Required Network Infrastructure for the 2000 census.

3. Security

The Decennial Management Division and Division Security Officer (DSO) will work with the ADP Security Branch to develop a systems security plan for the 2000 decennial census. Decentralized automation of census processes and electronic storage and transmission of data introduce security risks. The potential for unauthorized access by outsiders and for illegal use by insiders increases with: geographical distribution of the system; amount of data available through remote access equipment; and the number of persons allowed access to the equipment and files.

The interception of data communications, allowing intruders to modify, destroy or obtain data from the system must be considered as a possibility and eliminated. On the positive side, automation may help solve other security concerns such as reducing the handling of questionnaires by many employees during the various clerical operations.

Appropriate physical and electronic security measures including disaster recovery, will be implemented for decentralized offices. Physical security is needed to avoid the theft of the equipment, not only because of its monetary value but because of the potential loss of data. Such measures will also limit physical access to the computers, the stored census data, and other confidential census materials. Electronic security is needed to guarantee confidentiality of the data. A clear and consistent policy for the secure transmission of confidential data through various levels of the system will also be implemented.

Plan Title:	**2000 Decennial Census**
Plan Number:	**CB-DC-94-02-E**
Plan ID:	**IT**

PART II - ANNUAL PLAN

1. Architecture Status

The information technology strategy described in Part I is expected to remain valid through 2002. The most significant recent strategic change involves the increased use of contracting in place of the traditional decennial build-up. Contract work is now under way to perform requirements analyses for major systems.

The following seven types of contracts will be required to accomplish the Census 2000. It is our intent to use either existing contract vehicles (such as SEWP II) or to put new contracts vehicles in place. The Census Bureau will meet all existing IT management, and acquisition policies, procedures and regulations.

- **Contract 1:**

  Current DCS2000 -- Contract for Imaging Equipment and DCS2000, and Telecommunications infrastructure in the DCC:

  - **Data Capture Solution**. The contractor will provide a total data capture solution to check-in census forms received from the public and census enumerators, provide direct electronic imaging and high-speed data capture to digitally capture data contained on the forms, and prepare the captured data for tallying and statistical processing.

  - **Telecommunications Infrastructure in the DCC**. The contractor will provide and install the total network infrastructure required inside each DCC.

- **Contract 2:**

  Data Capture Center (DCC) -- Systems Integrator contract (SI) for all other DCC processing, including the following activities:

  - **Facilities Management**. The contractor will provide the space for the DCCs and will open, staff, manage and close the DCCs.

- **DCC Post-Processing Operations**. The contractor shall provide space, staffing and computer resources, as required, for all post-processing operations that take place in the DCCs. This could include sample coding (place of work, migration, I&O, etc.).

- **Deinstallation of Equipment**. The contractor will be responsible for deinstalling and disposing of all equipment in the DCCs. The Census Bureau will have the option of "acquiring" pieces of equipment needed for non-census applications.

- **Applications Development**. The contractor shall provide, as required, the necessary labor to assist in the development of the Major Decennial Computer systems (e.g. MIS, post data capture systems, TIGER/MAF, ICM, administrative records, etc.).

- **Training**. The contractor shall provide, as required, development of training materials and actual training.

- **Contract 3:**

  Field (Regional Census Centers and Local Census Offices)
  (Field) Processing -- Hardware and services contract for all field offices, including the following:

  - **Hardware for the RCCs and LCOs**. The contractor will provide and install all required hardware at the RCCs and the LCOs. If required, the contractor shall provide commercial-off-the-shelf software. All applications development will be done by the Census Bureau.

  - **Telecommunications Infrastructure in the RCCs and LCOs**. The contractor will provide and install the total network infrastructure required inside each RCC and LCO.

  - **Deinstallation of Equipment in the RCCs and LCOs**. The contractor will be responsible for deinstalling and disposing of all equipment in the RCCs and the LCOs.

  - **Applications Development.** The contractor shall provide, as required, the necessary labor to assist in the development of the Major Decennial Computer systems.

- **Contract 4:**

  Headquarter's Support -- Contract vehicles (existing or new) (HQ) to support IT in providing HQ's hardware, software and telecommunications support.

- **Hardware and Software for HQs**. IT will provide and install all required hardware and software at HQs or HQs remote site.

- **Telecommunications at HQs**. IT will be responsible for upgrading and installing all required telecommunications at HQs or HQs remote site.

- **Applications Development**. The contractor shall provide, as required, the necessary labor to assist in the development of the Major Decennial Computer systems.

- **Contract 5:**

  Telephone Questionnaire Assistance -- Contract out the (TQA) entire operation.

- **Contract 6:**

  Telecommunications Between Decennial Sites and HQs -- (Telecom) Telecommunications contract for all communications between all 2000 Decennial sites and HQs.

- Contract 7:

  Beta Site Contract

2. IT Objectives

In fiscal years 1997 and 1998, hardware and COTS software will be defined, procured, and installed for DCS 2000 and for Data Collection. See **3.B. Current Plans**. These and other software applications will be designed and developed, and made ready for testing. Installation of other hardware will follow for applications including PAMS/ADAMS, CAMS, CATI-QA, Customer Order Fulfillment, MAF Updating, and Tabulation, as will testing and implementation of software.

3. Status

A. Accomplishments/Progress

As part of the 1995 Test Census, the Bureau of Census:

- developed and tested a prototype electronic imaging data capture system that:

  - creates and stores images from approximately 150,000 short form questionnaire booklets;

  - uses optical mark recognition to determine the absence or presence of respondent marks or writing in answer areas;
  - (in a research mode) uses optical character recognition on some subset of write-in answer areas;
  - creates answer area image snippets of data that requires keying and presents those images to keying workstations.
  - produces ASCII data files of all answer fields on these forms.
  - provides a look-up, retrieve, and print capability for analysts to review full images of questionnaires.

- tested a census telephone network developed with AT&T, the FTS2000 contractor, to provide 1-800 menu activated assistance using touch tone and voice recognition services.
- used computer assisted telephone interviewing (CATI) systems to take census interviews over the phone (reverse CATI).
- used electronic telephone directory services to match addresses of nonrespondents to obtain telephone numbers; for those addresses for which telephone numbers were available, we attempted to contact those households and conduct a census interview by phone.

We will continue to research and develop other promising technologies which were not part of the 1995 census test. These include multimedia kiosks, pen-based computers with global positioning systems, and personal computer bulletin boards.

Specifically we will do the following in 1996:

- Plan and coordinate the development of overall strategies for automated systems for the 2000 census.
- Update technology assessments and complete technology evaluations and benefit/cost analyses to provide current information for final decisions on technology strategies for the 2000 census.
- Develop specifications to acquire technology.
- Project computer capacity requirements for clustered workstations at headquarters and other workstations elsewhere.
- Prepare Requirements Initiatives.

- Use pen computers to list addresses, update electronic maps, collect cost and progress data for a rural address listing special test.

- Conduct the 2000 Education Program which will use laptop computers and CD-ROM presentations to educate local government officials on how sampling for nonresponse follow-up will affect sampling and estimation in their areas.

- Continue the staged transition of imaging data capture equipment from prototype to pre-production models; finalize specifications for acquiring 2000 census data capture equipment; and provide systems experience during the 1996 census test.

- Develop a prototype administrative imaging system for decentralized offices.

- Design and specify FTS2000 telephone network, including the integration of CATI, and touch tone data entry interviewing.

4. Implementation Schedule

ACCT.	ACTIVITY	DAYS	START	END
01.05 HARDWARE/SOFTWARE/SERVICES ACQUISITION				
01.05.02 ADMINISTRATIVE - PAMS/ADAMS				
95700	Determine requirements	143	19APR96	12NOV96
95800	Prepare RI (included in Data Collection RI)	1	13NOV96	13NOV96
95900	Conduct b/ca (included in Data Collection b/ca)	11	4NOV96	14NOV96
96000	Develop Specifications	1	15NOV96	15NOV96
96100	Release RFI (if needed)	1	18NOV96	18NOV96
96200	Release RFP	1	19NOV96	19NOV96
96300	Conduct technical evaluation/benchmarking	1	20NOV96	20NOV96
96400	Award contract(s)	1	21NOV96	21NOV96
96500	Accept equipment for production/use	0		21NOV96
01.05.03 CAMS				
96700	Award DoC contract	1	19APR96	19APR96
96800	Develop Specifications	1	22APR96	22APR96
96900	Assess Relteck software	1	23APR96	23APR96
97000	Conduct technical evaluation/benchmarking	1	24APR96	24APR96

ACCT.	ACTIVITY	DAYS	START	END
97100	Accept equipment for production/use	1	1OCT97	1OCT97
01.05.04	CATI/QUESTIONNAIRE ASSISTANCE			
97300	Conduct benefit/cost analysis	91	19APR96	27AUG96
97400	Decide on contracting for services	83	28AUG96	27DEC96
97500	Develop Specifications	1	30DEC96	30DEC96
97600	Submit APR	18	31DEC96	27JAN97
97700	Release RFI (if needed)	1	28JAN97	28JAN97
97800	Release RFP	1	29JAN97	29JAN97
97900	Conduct technical evaluation/benchmarking	1	30JAN97	30JAN97
98000	Award contract(s)	1	31JAN97	31JAN97
98100	Accept equipment/services for production/use	76	30SEP97	21JAN98
01.05.05	CUSTOMER INFORMATION ORDERING/ASSISTANCE			
98300	Develop Specifications	76	19APR96	6AUG96
98400	Modify software	49	7AUG96	16OCT96
98500	Award contract	1	17OCT96	17OCT96
98600	Conduct technical evaluation and benchmarking	24	18OCT96	21NOV96
98700	Accept software for production/use	1	22NOV96	22NOV96
01.05.06	DCS 2000 AND PROCESSING			
98900	Determine data capture and decentralized process	219	19APR96	5MAR97
99000	Prepare benefit-cost analysis	119	6MAR97	21AUG97
99100	Prepare requirements initiative	137	22AUG97	12MAR98
99200	Develop Specifications	1	13MAR98	13MAR98
99300	Submit APR	266	16MAR98	5APR99
99400	Conduct vendor conferences	267	6APR99	26APR00
99500	Release RFP	1	27APR00	27APR00
99600	Conduct technical evaluation and benchmarking	318	28APR00	2AUG01
99700	Install prototype for Dress Rehearsal	14	3AUG01	22AUG01
99800	Award contract(s)	1	23AUG01	23AUG01
99810	Install prototypes for Dress Rehearsal	1	24AUG01	24AUG01

ACCT.	ACTIVITY	DAYS	START	END
99900	Accept equipment for production/use	41	27AUG01	24OCT01
01.05.07	DATA COLLECTION - FIELD ICM			
100100	Define requirements	301	19APR96	30JUN97
100200	Conduct benefit-cost analysis	122	1JUL97	24DEC97
100300	Prepare requirements initiative (hardware)	127	26DEC97	26JUN98
100400	Develop Specifications	77	29JUN98	16OCT98
100500	Select contractor (software)	1	19OCT98	19OCT98
100600	Identify contracts for hardware buys	277	20OCT98	26NOV99
100700	Award contract (hardware)	1	29NOV99	29NOV99
100800	Submit APR	1	30NOV99	30NOV99
100900	Accept equipment for production/use	958	1DEC99	23SEP03
01.05.08	DATA COLLECTION - OFFICE (RCC/LCO)			
101100	Determine U.S. data collection methodology/req.	324	19APR96	1AUG97
101200	Define Puerto Rico data coll. methodology/req.	314	1JUL96	29SEP97
101300	Define Island Terr. data coll. methodology/req.	314	1JUL96	29SEP97
101400	Conduct benefit-cost analysis	147	30SEP97	1MAY98
101500	Prepare requirements initiative	122	4MAY98	26OCT98
101600	Define collection systems and support structure	248	27OCT98	21OCT99
01.05.09	DATA PROCESSING - HEADQUARTERS			
101800	Define processing requirements	457	19APR96	13FEB98
101900	Conduct benefit-cost analysis	147	17FEB98	14SEP98
102000	Prepare requirements initiative	121	15SEP98	11MAR99
102200	Develop Specifications	152	12MAR99	14OCT99
102300	Identify contracts for hardware buys	290	15OCT99	12DEC00
102400	Submit APR	1	13DEC00	13DEC00
102500	Accept equipment for production/use	772	14DEC00	13JAN04
01.05.10	MAF UPDATING/MAP PRODUCTION AND UPDATING			
102700	Consider options for MAF updt. during census ops	43	19APR96	19JUN96
102800	Select scenario for MAF update during census ops	1	20JUN96	20JUN96

ACCT.	ACTIVITY	DAYS	START	END
102900	Review options - decentralize of MAF/TIGER maint.	1	21JUN96	21JUN96
103000	Select option - decentralize. of MAF/TIGER maint.	1	24JUN96	24JUN96
103100	Determine map production system requirements	303	1OCT943	0MAY95
103200	Develop hardware/software specifications	60	19APR96	15JUL96
103300	Identify contracts	1	16JUL96	16JUL96
103400	Submit APR	1	17JUL96	17JUL96
103500	Accept equipment /software for testing	1	2SEP97	2SEP97
01.05.11 MANAGEMENT INFORMATION				
103700	Develop Specifications	276	19APR96	23MAY97
103800	Identify contracts for hardware buys	1	27MAY97	27MAY97
103900	Submit APR	1	28MAY97	28MAY97
104000	Accept equipment for production/use	1	29MAY97	29MAY97
01.05.12 PUBLICATION QUALITY MAP PRODUCTION				
104200	Determine publication map production system req.	77	19APR96	7AUG96
104300	Specify h/w & s/w to produce standard maps	1	8AUG96	8AUG96
104400	Identify contracts for h/w & s/w buys	1	9AUG96	9AUG96
104500	Develop Specifications	1	12AUG96	12AUG96
104600	Identify contracts for hardware buys	1	13AUG96	13AUG96
104700	Submit APR	1	14AUG96	14AUG96
104800	Accept hardware/software for testing/production/	1	2NOV98	2NOV98
01.05.13 INTEGRATION AND SUPPORT FOR SERVICES				
01.05.14 TABULATION				
105000	Develop implementation plan/strategies	72	19APR96	31JUL96
105100	Develop requirements initiative	72	1AUG96	13NOV96
105200	Develop statement of work	124	14NOV96	13MAY97
105300	Release RFP	1	14MAY97	14MAY97
105400	Award contract	1	1JUL97	1JUL97
01.05.15 TELECOMMUNICATIONS				
105700	Conduct benefit/cost analysis	219	19APR96	5MAR97

ACCT.	ACTIVITY	DAYS	START	END
105800	Develop Specifications	150	6MAR97	6OCT97
105900	Submit APR	1	7OCT97	7OCT97
106000	Release RFP	1	8OCT97	8OCT97
106100	Conduct technical evaluation	28	9OCT97	19NOV97
106200	Award contract(s)	1	20NOV97	20NOV97

ACCT.	ACTIVITY	DAYS	START	END
01.06 SYSTEMS DEVELOPMENT AND TESTING				
01.06.01 ADMINISTRATIVE				
106500	Develop char.-based pers./payroll system (DR)	506	24APR96	29APR98
106600	Test system	302	30APR98	13JUL99
106700	Develop GUI-based pers./payroll system (post-DR)	302	24APR96	7JUL97
106800	Test system	302	2SEP97	13NOV98
01.06.02 ADMINISTRATIVE RECORDS				
107000	Determine files to be used	502	24APR96	23APR98
107100	Acquire/import data files for DR and 2000 census	718	8MAY96	19MAR99
107200	Prepare/test computer software	564	22MAR99	15JUN01
107300	Construct 2000 census admin. records database	40	18JUN01	13AUG01
01.06.03 AUTOMATED MATCHING				
107500	Analyze 1995 Census Test automated matching	250	24APR96	22APR97
107600	Identify most approp. s/w components for 2000	462	24APR96	26FEB98
107700	Modify system components based on 1995 Tests	502	24APR96	23APR98
107800	Specify h/w configuration for automated matching	502	24APR96	23APR98
107900	Test modified s/w during Dress Rehearsal	387	24APR96	5NOV97
108000	Evaluated automated matching in Dress Rehearsal	387	24APR96	5NOV97
108100	Update s/w components based on Dress Rehearsal	388	24APR96	6NOV97
108200	Evaluate performance of automated matching s/w	419	24APR96	23DEC97

ACCT.	ACTIVITY	DAYS	START	END
108300	Continue rsch - automated matching/unduplication	1758	24APR96	25APR03
01.06.04 CAMS				
01.06.05 CATI				
108700	Develop/test software for TQA	530	1APR98	9MAY00
108800	Develop/test software for CATI NRFU	252	1APR98	1APR99
01.06.06 CODING				
01.06.06.01 AUTOMATED GENERAL CODING				
109100	Obtain specifications for automated general coding	120	24APR96	11OCT96
109200	Develop/test software for automated general coding	984	3FEB97	3JAN01
01.06.06.02 INDUSTRY AND OCCUPATION				
109400	Obtain specifications for I&O coding	120	24APR96	11OCT96
109500	Develop/test software for I&O coding	984	3FEB97	3JAN01
01.06.06.03 PLACE OF BIRTH/MIGRATION/PLACE OF WORK				
109700	Plan POB-MIG-POW Coding System	892	24APR96	10NOV99
109800	Develop/test software for POB-MIG-POW coding	1	12NOV99	12NOV99
01.06.07 CUSTOMER INFORMATION ORDERING/FULFILLMENT				
110000	Survey previous customers	249	24APR96	21APR97
110100	Develop profile of previous orders	102	22APR97	15SEP97
110200	Develop product code scheme	83	16SEP97	15JAN98
110300	Design system	60	16JAN98	13APR98
110400	Test system	62	14APR98	10JUL98
110500	Update and refine software and system	121	1OCT98	29MAR99
01.06.08 DCS 2000				
01.06.09 DATA COLLECTION (OFFICE)				
110800	Develop specifications for collection systems	325	24APR96	7AUG97
110900	Develop and test software	325	8AUG97	24NOV98
01.06.10 DATA DISSEMINATION				
01.06.10.01 MEDIA AND SYSTEMS				
111200	Develop Internet and other on-line systems s/w	113	15OCT96	28MAR97

ACCT.	ACTIVITY	DAYS	START	END
111300	Install Census data packages	113	15OCT96	28MAR97
111400	Update and refine publication systems software	385	15SEP97	30MAR99
111500	Test system & process for delivering media	168	15JAN99	14SEP99
01.06.10.02 ON-DEMAND DATA PRODUCTS PREP/ACCESS				
01.06.10.02.01 DETERMINE REQUIREMENTS				
111800	Develop product profile from 1990 customer req.	22	2SEP97	1OCT97
111900	Determine requirements & scope of UDAP program	22	1SEP98	1OCT98
112000	Determine media access/output requirements	22	1SEP98	1OCT98
112100	Det. scope/features of product dissem. system	23	1DEC98	4JAN99
112200	Determine TIGER extract products	1	28DEC98	28DEC98
01.06.10.02.02 DEVELOP SYSTEM				
112400	Define char./content of INTERNET/on-line sys.	21	24APR96	22MAY96
112500	Convert publ. system to 2000 processing system	23	23MAY96	25JUN96
112600	Implement/test interface w/Internet, other sys.	22	26JUN96	26JUL96
112700	Est. system to produce, format, release data	22	29JUL96	27AUG96
112800	Complete conversion/enhancements/testing of sys.	22	1SEP99	1OCT99
01.06.10.02.03 DEVELOP S/W FOR CUST-SPECIFIED PRODUCTS/MAPS				
113000	Develop INTERNET/on-line software & load data	1	2JUN97	2JUN97
113100	Update/refine public. systems s/w, procedures	1	3JUN97	3JUN97
113200	Test system & admin. process to create CD-ROMs	1	4JUN97	4JUN97
01.06.10.03 ON-DEMAND DATA PRODUCTS SYSTEM				
113400	Identify disclosure problems/issues	1	24APR96	24APR96
113500	Review CPS/CenSAS/DAPS90/DPSS end-user systems	123	24APR96	17OCT96
113600	Review current Internet applications	123	24APR96	17OCT96
113700	Review SAS/Oracle/Sybase/Interbase systems	123	24APR96	17OCT96
113800	Eval. distrib. processing - 100 percent and sample data	251	24APR96	23APR97
113900	Evaluate metadata, data warehousing/EIS/DSS s/w	440	24APR96	26JAN98
114000	Evaluate front-end tools to access data	440	24APR96	26JAN98
114100	Adopt TIGER as identifier for all data products	128	24APR96	24OCT96

ACCT.	ACTIVITY	DAYS	START	END
114200	Create Internet forum to post ideas/comments	251	24APR96	23APR97
114300	Build distributed database for common data sets	502	24APR96	23APR98
114400	Develop expert rules for disclosure	630	24APR96	26OCT98
114500	Establish identifiers for linking/merging data	630	24APR96	26OCT98
114600	Develop prototype	501	1OCT96	29SEP98
114700	Create indexes of definitions	374	1OCT96	31MAR98
114800	Design CenSAS to run on mult. distrib. platforms	379	1APR97	30SEP98
114900	Differentiate internal/external Bureau products	379	1APR97	30SEP98
115000	Identify current/future products to access data	379	1APR97	30SEP98
115100	Add front end to perform tabulation/extraction	251	1APR97	31MAR98
115200	Migrate system to Internet	165	1OCT97	29MAY98
115300	Incorporate capability to order custom STF files	86	1JUN98	30SEP98
115400	Incorporate access to 2000 STF files (if exist)	376	1OCT98	3APR00
115500	Complete customer-specified dissemination system	0		3APR00
01.06.10.04 DESIGN STANDARD DATA PRODUCTS/MAPS				
115700	Develop prototype PL 94-171 products	175	1JUN98	10FEB99
115800	Develop product plans for 100 percent data products	581	11FEB99	4JUN01
115900	Develop product plans for sample data products	581	11FEB99	4JUN01
01.06.10.04.01 PUERTO RICO PRODUCTS				
116100	Determine scope of program	335	24APR96	21AUG97
116200	Determine req. for standard products/maps	335	22AUG97	23DEC98
116300	Det. scope of on-demand data products/access	20	24DEC98	25JAN99
116400	Define content of Internet/other on-line systems	20	26JAN99	23FEB99
116500	Develop final proposal for 2000 product line	250	24FEB99	22FEB00
116600	Design standard products/maps	523	23FEB00	22MAR02
116700	Develop product plans for redistricting products	20	23FEB00	21MAR00
116800	Develop plans for 100 percent-related data products	21	1MAY00	30MAY00
116900	Develop plans for sample-related data products	19	1SEP00	28SEP00
01.06.10.04.02 ISLAND TERRITORIES PRODUCTS				

ACCT.	ACTIVITY	DAYS	START	END
117100	Determine programming requirements	335	24APR96	21AUG97
117200	Determine requirements - standard data products	335	22AUG97	23DEC98
117300	Develop final proposal for 2000 product line	250	24DEC98	22DEC99
117400	Design standard products/maps	523	23DEC99	24JAN02
01.06.11 DATA PROCESSING				
117600	Determine precensus processing work flow	331	24APR96	15AUG97
117700	Develop specifications for precensus programs	834	3SEP96	30DEC99
117800	Develop/test s/w for precensus programs	836	2DEC96	31MAR00
117900	Develop/test s/w for automated support/control	965	3MAR97	3JAN01
118000	Program/implement weighting & est. procedures	732	3AUG98	2JUL01
118100	Determine postcensus processing work flow	382	24APR96	29OCT97
118200	Develop specifications for postcensus programs	752	2JAN97	30DEC99
118300	Develop/test software for postcensus programs	903	3MAR97	2OCT00
01.06.11.01 ICM PROCESSING				
118500	Develop specifications for ICM processing	605	24APR96	18SEP98
118600	Develop/test software for ICM processing	839	21SEP98	25JAN02
01.06.11.02 PUERTO RICO PROCESSING				
118800	Determine work flow	207	24APR96	20FEB97
118900	Develop specifications	628	21FEB97	19AUG99
119000	Develop/test software	593	20AUG99	2JAN02
01.06.11.03 ISLAND TERRITORIES PROCESSING				
119200	Determine work flow	313	24APR96	22JUL97
119300	Develop specifications	1	23JUL97	23JUL97
119400	Develop/test software	501	1OCT97	29SEP99
01.06.12 MAF UPDATING/MAP PRODUCTION AND UPDATING				
119700	Draft standards for local address lists	191	1NOV94	23APR96
119705	TIGER file improvement program	1	2JAN95	23APR96
119710	Address matching to build MAF	1	1SEP95	1SEP95
119715	Consult with stakeholders on standards	88	1MAR95	23APR96

ACCT.	ACTIVITY	DAYS	START	END
119720	Publish draft local add. list stds - city-style	21	11AUG95	23APR96
119725	Review cmts/revise local stds - city-style	20	16OCT95	23APR96
119730	Publish final local add. list stds - city-style	1	16OCT95	23APR96
119735	Accept/process local address lists	1	31OCT95	23APR96
119745	Publish draft local add. list stds - rural-style	21	3SEP96	1OCT96
119750	Review cmts/revise local stds - rural-style	24	11SEP96	15OCT96
119755	Publish final local add. list stds - rural-style	1	30OCT96	30OCT96
119760	Pub. draft address program stds (listing, LUCA)	22	1OCT96	31OCT96
119765	Review cmts/revise add. sharing stds.	24	11OCT96	15NOV96
119770	Pub. final address pgm. stds. (listing, LUCA)	1	2DEC96	2DEC96
119775	Publish draft appeals process standards	22	1OCT97	31OCT97
119780	Review cmts/revise appeals process stds.	28	21OCT97	1DEC97
119785	Publish final appeals process stds	1	15DEC97	15DEC97
119790	MAF available for census operations (through DR)	124	30SEP97	31MAR98
01.06.13 PUBLICATION QUALITY MAP PRODUCTION				
119800	Design product mapping system	531	24APR96	4JUN98
119805	Complete design of product mapping system	0		23APR96
119810	Develop/test software for product mapping system	1397	24APR96	15NOV01
119815	Complete software for product mapping system	0		1FEB00
120100	Determine 2000 census map products	961	24APR96	23FEB00
120200	Design standard data product mapping systems	605	24APR96	18SEP98
120300	Develop/test s/w for standard data products	909	1JUL97	14FEB01
120400	Design customer-specified mapping systems	757	24FEB00	28FEB03
120500	Dev./test s/w for customer-specified mapping sys	909	24FEB00	3OCT03
01.06.14 INTEGRATION AND SUPPORT FOR SERVICES				
01.06.15 TABULATION				
120800	Develop/test 100 percent analyzer/P.L. 94-171 products	153	24APR96	2DEC96